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Trip Report - Contract 605, Task Orders 8, 9, 10, 11, 12

1. [redacted]
was visited on 29 and 30 November and 1 December 1960, to monitor progress on the subject contract. Present for discussions were:

2. The design and fabrication of the 50 to 500 mc antenna-filter-detector system has been completed, and system tangential sensitivity tests are in process. A modification consisting of an impedance matching transformer between the filter and detector has resulted in a system response 12 db greater than expected. Complete system performance data is being compiled for publication in the final report.

3. Final models of the 500 to 1000 mc and 1 to 10 KMC LP antennas have been constructed, however, final system checks are awaiting completion of stripline filters to cover the 500 to 10,000 mc frequency range. A prototype of each of the filters has been constructed and initial evaluation indicates satisfactory results.

4. Although the high pass filtering characteristics of air dielectric, plexiglass dielectric, and a high dielectric material ($\epsilon_r = 14$) have been satisfactory in decreasing the cutoff frequency of the 40 KMC horn to cover the 10 to 40 KMC frequency range, some difficulty has been experienced in consistently reproducing the horn-filter for the 10 to 40 KMC passband. Signal degradation as great as 6 db at frequencies around 35 KMC is attributed to excessive wear on the dielectric slab ($\epsilon_r = 14$) with repeated insertions. The fragile nature of the material used for this loading slab and the fact that insertion wear tends to produce lobe splitting may dictate the acceptance of a permanently loaded horn to cover the 10 to 40 KMC range if the degradation at 35 KMC cannot be tolerated.

5. Construction of five 1 to 10 KMC antenna/Dish Feed Antennas, AN-46 is nearing completion and delivery is expected to be on schedule. (January '61)

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6. Two methods of effecting maximum power transfer by utilizing noise power techniques were demonstrated at [redacted]. One method involved matching narrow band noise output from the antenna to the receiver input using the receiver output as an indicator. The other method involves placing the receiver and antenna in opposite arms of a bridge circuit and using the receiver as a detector tuning for a null. The use of a wide band noise source of very low power output ($\frac{1}{2}$ db above ambient at 80 feet) greatly enhances the tuning and matching technique in that impulse noise is not present in the steady output from the noise generator. Using the bridge network and wideband noise generator a metal coat hanger was matched to the output of a 100 watt transmitter. Measured output power was 100 watts with 5 watts reflected. Working the ham bands on 7 and 14 mc produced contacts with Clearwater, Florida, and Pomona, California, respectively.

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